Indian Institute of Technology dhArwAD

|| सा विद्या या विमुक्तये ||
ಭಾ.ತಂ.ಸಂ. ಧಾರವಾಡ
भा. प्रौ. सं. धारवाड
I.I.T. DHARWAD

Information Brochure

M.Tech. Admissions

Academic Year 2024-25

(For Indian Nationals)

CONTENTS

Section I

General Information on Admission Process

A. SCHEDULE OF MASTER OF TECHNOLOGY (M.TECH.) ADMISSION

Sr. No.	Description	Relevant dates*
1.	Applications open	02-April-2024
2.	Last date to apply online	23-April-2024 (Up to 5:00 PM)
3.	Announcement of shortlisted candidates as per the Common Offer Acceptance Portal or COAP. Main rounds of offers are available in COAP. There may be additional rounds as per the COAP.	https://iitk.ac.in/coap2024/important-dates

All potential candidates are requested to visit the institute website regularly for updated information about the schedule. **The updates regarding the admission process will be made available on the institute website under section Academics >> Admissions >> M.Tech.**

B. FINANCIAL SUPPORT

IIT dhArwAD admits candidates for full-time M.Tech. Program, under Teaching ASSISTANTSHIP (TA).

B.1 TEACHING ASSISTANTSHIP (TA)

Funded by the Ministry of Education (MoE, formerly known as MHRD), the TAs are expected to assist in the academic/administrative work for smooth functioning of the institute. Students under this category are entitled to financial support as per the MoE norms.

1. The assistantship is payable for a maximum duration of two academic years. At present, the monthly rate of assistantship is ₹12400.

2. To get the TA stipend, the students concerned must assist in teaching, research and/or administrative work as assigned by the respective academic unit to the extent of 8 hours work per week.

3. The continuation of the assistantship will be subject to the satisfactory performance of the duties assigned by the departments as well as satisfactory academic performance.

4. As per MoE directives, the employees on the rolls (with or without pay) of any organization are not eligible for admission under this category. Candidates selected in this category must resign from their current job and submit a relieving letter from their employer before joining the program.

C.   APPLICATION PROCESS

1. Please read all the instructions given in the brochure carefully before filling up the application form.

2. Please note that while admission offers will be made using Common Offer Acceptance Portal (COAP), the application for M.Tech. program has to be first submitted using IIT dhArwAD portal to be considered for the respective program at IIT dhArwAD.

3. You are required to submit the application form online. There are no downloadable forms available. Please note that the application is to be filled in in one go. There is no save and proceed option. The application process flow is given below.

    Register your profile on COAP portal >> Keep all the documents including COAP registration number, GATE score card handy >> pay the application fee through SBI e-collect facility >> Note down SBI e-collect reference No >> Start online application form >> Fill all particulars including SBI e-collect reference No >> Take a print or save a pdf copy of preview of completed application form >> Final submission of application form >> Note down submission ID for future reference.

4. The procedure to pay the application fee through SBI e-collect facility is made available on the website. Candidates are requested to pay the application fee through the steps/procedure described. Candidates may contact pgadmissions@iitdh.ac.in for any errors/issues pertaining to payment of application fees.

5. This information brochure and future updates regarding the admission process will be made available on the institute website under section **Academics >> Admissions >> M.Tech.**

6. After filling in the form, you are advised to take a print and keep the same for future reference. After successful submission of the form, you should receive a confirmation email. In case you have not received any e-mail confirmation, within one-hour post submission, you are requested to resubmit the form.

7. The application fee is as follows: Please visit the link given below and choose "Application Fee (M. Tech/MS/PhD)", fill in all the particulars and chose an amount based on your social category. **Please submit and note down the transaction reference number to be mentioned in the application form as well as for future reference.**

State Bank Collect (onlinesbi.sbi)

Gen/Gen (EWS)/OBC/ all other candidates	**₹ 200/-**
Women/SC/ST/PwD category candidates	**₹ 100/-**

8. **The application form without valid online payment details is liable for rejection. Application fee is Non-Refundable.**

9. Applicant may find it convenient to keep following information handy while filling the application form online (whichever relevant):

- COAP Registration Number
- Digital photograph (with size less than 50 KB)
- SBI e Collect Reference Number
- Educational details (from secondary school onward)
- GATE qualification details

10. Amendments to the form will not be possible once the last date to apply online is over. However, amendments can be considered if the applicant resubmits the entire form without making repeat fee payment before the deadline. In case of identical applications only the latest application will be considered.

11. Check your emails regularly for any communication from the institute regarding the selection process.

12. Check the institute website and COAP regularly for updates regarding the selection process. Admission offer will be made through COAP. Applicants are requested to accept/retain/reject offers using COAP portal as per the rules and timeline described by COAP.

13. **Candidates should have all their documents ready; they should be able to produce the same on a short notice. The documents include all educational qualification, GATE score card and a valid category certificate etc.**

D. MODALITY OF SELECTION PROCESS

For admission through GATE score, the candidates with higher GATE scores will be allotted seats based on their social category. Candidates can access the offers made (from IIT dhArwAD) on COAP website during the time window mentioned in COAP.

Tie-breaker criteria for the instances when the GATE score is same among multiple candidates within the same social category will be as follows in that order:

i)The aggregate academic performance in their B.Tech./B.E. till the last date for applying for the program.

ii)Seniority of the candidate based on their date of birth. The candidates with an earlier date of birth will be given preference.

For the candidates who have B.Tech. or equivalent degree or allied branches from IITs OR BS or equivalent degree in CSE or allied branches from IISc with minimum CPI/CGPA of 8.0 on the scale of 0-10, the selection will be based on CPI/CGPA only.

E. FEES, DEPOSITS & HOSTEL RENT

TA CATEGORY

The general fee structure of M. Tech. program is as below, kindly note that the fee structure is for reference only.

Sl. No.	Fee Amount (In ₹)	General/EWS/OBC	SC/ST/ Divyangjan
	A. One-time payment at the time of Admission		
1	Admission Fee	300.00	300.00
2	Academics Service Charges	1,200.00	1,200.00
3	Alumni Lifetime Membership	2,000.00	2,000.00
4	Convocation fee	3,000.00	3,000.00
	Sub-Total (A)	**6,500.00**	**6,500.00**
	B. Semester Fee		
1	Registration Fee	1,500.00	1,500.00
2	Tuition Fee	#5000.00	## Nill
3	Examination Fee	2,000.00	2,000.00
4	Library	500.00	500.00
5	Gymkhana Fee	3,000.00	3,000.00
6	Hostel Room Rent	1,000.00	1,000.00
7	Electricity & Water Charges	2,500.00	2,500.00
8	Medical and Wellness Fee	2,500.00	2,500.00
9	Student Benevolent Fund	1,000.00	1,000.00
10	Hostel Establishment and Service Charge	2,500.00	2,500.00
11	Mess Establishment and Service Charges	1,500.00	1,500.00
12	Student Activity Establishment charges	2,000.00	2,000.00
	Sub-Total (B)	**25,000.00**	**20,000.00**
Mess Advance		**24,500.00**	**24,500.00**
Medical Insurance Premium (MIP) (Annually)		**1,500.00**	**1,500.00**
	C. Deposits (Refundable) to be paid at the time of Admission		
1	Library Deposit	1,000.00	1,000.00
2	Institute Deposit	5,000.00	5,000.00
3	Mess Deposit	5,000.00	5,000.00
	Sub-Total (C)	**11,000.00**	**11,000.00**
GRAND TOTAL FEE (A + B + Mess Advance + MIP + C)		**₹ 68,500.00**	**₹ 63,500.00**

Note:

    a. #IIT dhArwAD reserves the right to revise the Tuition Fee-Statutory Fee (in future).

    b. ##All the SC/ST/Divyangjan students are exempted from payment of Tuition fee.

F. INFORMATION PERTAINING TO HOSTELS

About IIT dhArwAD	Kindly visit the website https://www.iitdh.ac.in/ for available facilities
Hostel room allocation. (on sharing basis)	You will be allotted a room in the hostel & the room key will be handed over on your arrival at the institute. Each room will accommodate roughly two/four students (depending on the prevailing conditions) and has an attached bath & toilet.
Are hostel rooms furnished	Each student will be provided a cot, chair & study table, and wardrobe. Students can purchase mattress/bedding, bucket, etc. locally. Arrangements will be made for on-campus shopping for these items.
Possession of motorized vehicle	NOT ALLOWED, however bicycles are permitted in the campus.
Climatic conditions	The weather at dhArwAD is pleasant throughout the year. Generally, it will be raining in the months of June to September and weather will be windy and cold during the months of October to January. It is suggested that you carry protective clothing accordingly.

Section II

Department Specific Information

G. DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CSE)

G.1 ELIGIBILITY FOR ADMISSION

G.1.a Qualifying Degree

- B.Tech./B.E. in CSE or other branches, MSc in Computer Science, MCA.

G.1.b Minimum Eligibility Criteria

G.1.b.1 Valid GATE score

Valid GATE score in CSE (GATE paper code: CS) is essential for all the candidates, except for candidates who have B.Tech. or equivalent degree in CSE and allied branches from IITs or BS degree or equivalent degree in CSE or allied branches from IISc with a minimum CPI/CGPA of 8.0 on the scale of 10.

G.1.b.2 Minimum Score in The Qualifying Degree:

For General/General (EWS)/OBC category candidates and/or for candidates where no concession in academic performance is called for, the eligibility criteria in the qualifying degree (B.Tech./B.E.) is either:

- a minimum of 60% marks (without round off) in aggregate over the entire duration of the undergraduate program.

- a minimum Cumulative Grade Point Average (CGPA) or Cumulative Performance Index (CPI) of 6.0 on the scale of 0-10; with corresponding proportional requirements when the scales are other than on 0-10, (for example, 4.8 on a scale of 0-8).

- Candidates with MSc in Computer Science have eligibility criteria of a minimum of 60% marks in both BSc in Computer Science and MSc in Computer Science.

- Candidates with MCA have eligibility criteria of a minimum of 60% marks in both BCA and MCA.

- For SC/ST/PwD category candidates, a relaxation of 5% in the performance at the qualifying degree is applicable.

Merely satisfying the eligibility conditions does not guarantee selection into the program.

G.1.b.3 Applicants in The Final Phase of Getting Qualifying Degree

Students who are in the final phase of receiving above mentioned qualifying degree and who are likely to graduate before the commencement of Autumn 2024-25 semester of IIT dhArwAD are also eligible to apply. However, if offered, the admission to those candidates would be provisional. To join an academic program at IIT dhArwAD, such candidates need to furnish necessary documents regarding completion of the degree on the date of joining IIT dhArwAD. The date of joining will be announced later the institute website. The candidate needs to meet the criteria specified in section above considering updated score in the qualifying degree, in the meanwhile, the aggregate academic performance announced by the respective university till the last date to apply online (mentioned in section A) should be used to determine eligibility for application and same to be reported in the online application.

G.2 SCREENING CRITERIA OF APPLICATIONS

For General/General (EWS) category candidates and/or for candidates where no concession in academic performance is called for, the eligibility requirement in the GATE score is cutoff of 500. And for other categories, relaxation is given as per GOI norms.

G.3 FINANCIAL SUPPORT CATEGORY

The Department of CSE at IIT dhArwAD invites applications for the M.Tech. in CSE under the TA category for the Academic Year 2024-25. Note that at the time of admission, the students will be admitted into the program through common offer acceptance portal (COAP).

G.4 NUMBER OF AVAILABLE SEATS

The total number of seats available in the TA category is 33*+.

*30 seats are distributed as per the seat matrix for different social categories. The admission is purely based on the GATE score and as per the criteria specified in previous Sections.

+3 seats are supernumerary and are distributed among the candidates who have B.Tech. or equivalent degree in CSE or allied branches from IITs or BS or equivalent degree in CSE or allied branches from IISc with minimum CPI/CGPA of 8.0 on scale of 0-10.

G.5 DEPARTMENT LEVEL CONTACTS FOR ADMISSION PROCESS ENQUIRIES

For queries related to MTech admissions in the CSE, one can write to pgadmissions.cse@iitdh.ac.in with the subject "Query related to MTech Admissions in CSE."

H. PROGRAM STRUCTURE (M.Tech. IN COMPUTER SCIENCE AND ENGINEERING)

Total credit requirement for the course completion is a minimum of **125 credits** with the following distribution:

- 61 Credits of Course Work
  - Of the 61 credits, a seminar course of 4 credits needs to be done. This course is categorized as Institute Core (IC).
  - Of the 61 credits, 21 credits need to be done via courses offered by the CSE department. These courses are categorized as Program Core (PC).
  - Of the 61 credits, up to 36 credits can be done via courses categorized as electives (E). Of these 36 credits, at least 24 credits should be from or related to the CSE discipline. Remaining credits can be outside of or from the CSE discipline.
- Students may fulfill their elective credit requirements by enrolling in a maximum of 12 credits of undergraduate (UG) courses, with the approval of faculty advisor (FA).
- 64 Credits of M.Tech. Project. This is categorized as Institute Core (IC)
- Compulsory communications skills course (PP/NP i.e. Pass/Not Passed). This course does not carry any credits.

In Summary, 68 credits are to be earned via courses categorized as IC and 21 credits via courses categorized as PC and 36 credits via courses categorized as E.

SEMESTERWISE CREDITS DISTRIBUTION (PRESCRIBED DISTRIBUTION)

Semester 1 (a minimum of 27 credits needs to be earned)	**Semester 2** (a minimum of 32 credits to be earned.)	**Semester 3**	**Semester 4**
21 Program Core (PC) credits. Of these, 7 credits are earned via lab-based courses.	• 4-credit Seminar Course (PC) • 32-34 credits of electives (E) Note: by the end of this semester, a cumulative of 36 credits of electives (E) courses must be completed.	M.Tech. Project I 32 credits	M.Tech. Project II 32 credits
6 or (up to) 8 credit elective course (E)			
Communications skills course (PP/NP)			

List of Courses

- Advanced Data Structures and Algorithms (PC, 6 credits)
- Combinatorics and Probability (PC, 6 credits)
- Advanced Data Structures and Algorithms Lab (PC, 3 credits)
- Advanced Software Development Laboratory
  (PC, 6 credits, includes 2 credits worth lecture sessions and 4 credits worth labs sessions.)

List of Electives

A number of electives from the CSE discipline are offered. Some of these are listed below. Note that the list is not exhaustive.

- Logic for Computer Science
- Advanced Computer Architecture
- Statistical Pattern Recognition and Lab
- Graph Theory and Combinatorics
- Advanced Distributed Systems
- Reinforcement Learning and Lab
- Parameterized Algorithms and Complexity
- Advanced Computer Networks
- Pattern Recognition and Machine Learning and Lab
- Logic and Applications
- Software Development for Scientific Computing
- Mathematics for Data Science
- Formal models of concurrent and asynchronous systems
- FPGA for Communication Networks Prototyping
- Neural Networks and Deep learning and Lab
- Topics in Automata and Logics
- Software defined Networking and Network Function Virtualization
- Speech processing and Lab
- Approximation Algorithms
- Advanced Embedded Computing
- Probability Models
- Advanced Automata Theory
- Compilers - Principles and Implementation
- Introduction to Block chain Mining Massive Datasets
- Parallel Computing

I. DEPARTMENT OF ELECTRICAL, ELECTRONICS AND COMMUNICATION ENGINEERING (EECE)

The Department of EECE at IIT dhArwAD invites applications for the M.Tech. in Electrical Engineering with the following specializations under for the Academic Year 2024-25:

1. Microelectronics and VLSI (MVLSI)
2. Communication, Signal Processing and ML (CSPML)
3. Power electronics and Power systems (PEPS)

Note: At the time of admission, the students will be admitted to one of the above specializations through COAP.
The candidate must fill out the entire form separately if he/she aspires to apply for more than one specialization.

I.1 ELIGIBILITY FOR ADMISSION

I.1.a General Eligibility Criteria

1. B.Tech./B.E. in Electrical Engineering,
   a. Electronics and communication Engineering,
   b. Instrumentation engineering
   c. Instrumentation and control engineering
   d. Tele communication engineering
   e. Electronics and Telecommunication engineering
   f. Electrical and Electronics

2. A valid GATE score in one of the following papers
   Electrical Engineering (GATE Paper code: EE) or Electronics and Communication Engineering (GATE Paper code: EC) or Instrumentation Engineering (GATE Paper code: IN)

**Valid GATE score is essential for all the candidates, except for candidates who have B.Tech. or equivalent degree from IITs or BS degree from IISc with a minimum CPI/CGPA of 8.0 on the scale of 10.

I.1.b Minimum Score in The Qualifying Degree

For General/General (EWS)/OBC category candidates and/or for candidates where no concession in academic performance is called for, the eligibility criteria in the qualifying degree (B.Tech./B.E.) is either of the following two:

- A minimum of 60% marks (without round off) in aggregate over the entire duration of the undergraduate program.
- A minimum Cumulative Grade Point Average (CGPA) or Cumulative Performance Index (CPI) of 6.0 on the scale of 0-10 with corresponding proportional requirements when the scales are other than 0-10 (for example, 4.8 on a scale of 0-8).

For SC/ST/PWD category candidates, a relaxation of 5% in the performance at the qualifying degree is applicable.
Merely satisfying the eligibility conditions does not guarantee selection into the program.

I.2 APPLICANTS IN THE FINAL PHASE OF GETTING QUALIFYING DEGREE

The students who are in the final phase of receiving the above-mentioned qualifying degree and are likely to graduate before the commencement of the Autumn 2024-25 semester are also eligible to apply. However, if offered, the admission to those candidates would be provisional. To join the academic program at IIT dhArwAD, such candidates need to furnish necessary documents regarding completion of the degree on the date of joining IIT dhArwAD. The date of joining will be announced later on the institute website. The candidate needs to meet the criteria specified in Section I.1 above considering the updated score in the qualifying degree. In the meanwhile, the aggregate academic performance announced by the respective university till the last date for submission (mentioned in section A) should be used to determine eligibility for application, and the same should be reported in the online application.

I.3 SCREENING CRITERIA OF APPLICATIONS

The GATE cut off for applying to the M.Tech. Programs are as follows: Each specialization will have a cut off 350 for General/General (EWS) and for other categories, relaxation is given as per GOI norms.

I.4 FINANCIAL SUPPORT CATEGORY

The Department of EECE at IIT dhArwAD invites applications for the M.Tech. in Electrical Engineering under the TA category for the Academic Year 2024-25

I.5 NUMBER OF AVAILABLE SEATS

The total number of seats available in the TA category are as follows:
Microelectronics and VLSI: 15 students
Communication, Signal Processing and ML (CSPML): 15 students
Power electronics and Power systems (PEPS): 15 students

In each of the specializations, 15 seats are distributed as per the seat matrix for different social categories.

*15 seats in each specialization are to be admitted purely based on the GATE score and as per the criteria specified in Sections G.1 and G.3.

**1 seat in each specialization is supernumerary for the candidates who have B.Tech. or equivalent degree from IITs or BS from IISc with a minimum CPI/CGPA of 8.0 on scale of 0-10.

I.6. DEPARTMENT LEVEL CONTACTS FOR ADMISSION PROCESS ENQUIRIES

For queries related to M.Tech. admissions in the Electrical, Electronics, and Communication Engineering Department, one can write to pgadmissions@iitdh.ac.in with the subject "Query related to MTech Admissions in EECE Department".

J. PROGRAM STRUCTURE (M.Tech. IN ELECTRICAL ENGINEERING WITH SPECIALIZATIONS)

Total credit requirement for the course completion: minimum **131 credits** with following distribution:

1. Core Theory courses = 18 **credits** from courses prescribed in Core theory basket
2. Core lab courses = 3 credits from the courses prescribed in Core lab basket
3. Seminar course = 4 credits
4. Students admitted should complete electives courses = 24 credits from one of the following baskets depending on the specialization to which the student got admitted:
   a. Communications and Signal processing
   b. Microelectronics and VLSI
   c. Power electronics and power systems
5. The remaining 18 credits can be chosen from any basket (in addition to core theory, core lab and seminar credits) or outside the department courses subject to the following requirements.
   a. A student can take up to two electives (12 credits) from outside the department to meet their elective credits requirements. These electives must be at level 600 or above (PG level courses).
   b. A student can take at most 1 UG elective (6 credits), i.e., 300 or above Level course to meet their elective credits requirements.
6. 64 credits from M.Tech. project I and M.Tech. project II (32 credits each).
7. Compulsory communications skills course (PP/NP i.e. Pass/Not Passed). This course does not carry any credits.

Semester wise credits distribution (prescribed distribution)

Semester 1	Semester 2	Semester 3	Semester 4
18 core theory credits	30 credits of electives	M.Tech. Project I 32 credits	M.Tech. Project II 32 credits
3 core lab credits			
3 credits seminar			
12 credits electives			
Communications skills course (PP/NP)			

List of courses

The core theory courses are (6 credits each)
1. Linear Algebra and its applications
2. Embedded systems design (new course)
3. Probability and applications
4. Multivariable Control Systems

The student must take at least 3 out of these 4 courses to complete the core theory course requirements regardless of the specialization

The core lab courses are (3 credits each)
1. Embedded systems design lab (new course)
2. VLSI Simulations Lab (new course)

The student must take at least 1 out of these 2 lab courses to complete the core lab course requirements regardless of the specialization.
All the core theory and lab courses will be offered in the Autumn semester (odd semester and the first semester for fresh students).

List of electives

Autumn (Odd) semester

Basket: VLSI and Microelectronics	- VLSI Design - Physics of Transistors - Analog IC design - Nano electronics
Basket: Communication, Signal Processing and Machine learning	- Speech Processing - Speech Processing Lab
Basket: Power electronics and power systems	- Photovoltaic system design - Power Systems Dynamics and Control

Spring (Even) Semester

Basket: VLSI and Microelectronics	- Mixed signal VLSI Design - VLSI Technology - Power semiconductor devices - System Design of Electronic Products - VLSI Testing and testability
Basket: Communication, Signal Processing and Machine learning	- Pattern Recognition and Machine learning (PRML) - PRML Lab - Detection and estimation theory - Optimization theory and algorithms - Next generation wireless networks - Wireless communications - Neural networks and deep learning (NNDL) - NNDL Lab
Basket: Power electronics and power	Advanced Electric Drives

systems	- Design of power converters - Micro grid dynamics and control - System Design of Electronic Products - Power system protection - Smart grid - Power systems operation and control - Modeling and control of renewable energy sources - Electric Vehicles: Systems and components - Advanced power electronics and drives - Power System Protection (3-0-0-6) - Power System Simulation Lab (0-0-3-3)

K. DEPARTMENT OF MECHANICAL, MATERIALS, AND AEROSPACE ENGINEERING

The Department of Mechanical, Materials, and Aerospace Engineering (MMAE) was started as the Department of Mechanical Engineering in the year 2016, the same year of establishment of IIT dhArwAD. The department was renamed in the year 2019. Since its inception, the department has been offering a four-year B.Tech. Program in Mechanical Engineering at an undergraduate level. At the postgraduate level, the department offers research programs such as M.S. (by Research) and Ph.D. programs. From the autumn semester 2022-23, Department of MMAE started a two-year M.Tech. in Mechanical Engineering.

The Department's UG and PG curriculum offers a distinct combination of courses with sound conceptual understanding together with practice-oriented learning elements. The theoretical rigor is imparted from a selection of courses in basic sciences and interdisciplinary topics in addition to subjects from the core mechanical and materials engineering curriculum, which are backed by an array of hands-on laboratory courses.

The faculty of the department work on various core research areas and on an extensive list of interdisciplinary research areas. The research areas of MMAE faculty members are listed below.

Stream	Area of Research
Thermal and Fluid	- Computational Fluid Dynamics (CFD) - Non-Newtonian flows, - Turbulence - Compressible flows - Multiphase flows - Fluid Structure Interaction (FSI) - Machine learning for fluid mechanics - Turbomachinery aerodynamics - Experimental methods in fluid mechanics - Thermoacoustic - Combustion - Fire dynamics and fire safety. - Gas turbine blade cooling - Atomization and sprays - Environmental fluid mechanics
Design stream	- Computational and experimental mechanics - Finite Element Methods (FEM) - Nonlinear mechanics - Reduced order modeling - Thin film dynamics - Computational biomechanics - Robotics - Rigid multibody kinematics and dynamics - Static Balancing - Topology optimization - Tribology and contact mechanics.

	- Vibrations - Mechanics of composite materials - Fracture mechanics. - Mechanics of cellular solids - Computer vision
Materials and Manufacturing	- Metal forming and plasticity. - CAD/CAM - Numerical analysis of forming processes - Fracture mechanics. - Additive manufacturing 4D Printing smart material. - CNC machining - Micromechanical modeling of materials - Material testing and characterization - Dislocation dynamics and Crystal Plasticity modeling - Light weight and high temperature structural materials - Digital Twins - Computational Materials Science - Multi-functional coatings

K.1. ELIGIBILITY FOR ADMISSION

K.1.a. General Eligibility Criteria

1. B.Tech./B.E. or equivalent degree in Mechanical Engineering or Materials and Metallurgical Engineering or Aerospace Engineering or other related streams*
2. A valid GATE score in one of the following papers AE, ME, MT, PI, XE (A, B, C, D, E) **
3. The GATE cutoff for applying to the M. Tech program is 350 for General/General (EWS) and for other categories relaxation is given as per GOI norms.

*Related streams: Production, Industrial, Automobile, Aeronautical, Mining Engineering and M.Sc. in Physics or Material Science

**Valid GATE score is essential for all the candidates, except for candidates who have B.Tech. or equivalent degree from IITs or BS degree from IISc with a minimum CPI/CGPA of 8.0 on the scale of 10.

K.1.b. Minimum Score in The Qualifying Degree

For General/General (EWS)/OBC category candidates and/or for candidates where no concession in academic performance is called for, the eligibility criteria in the qualifying degree (B.Tech./B.E.) is either of the following two:

- A minimum of 60% marks (without round off) in aggregate over the entire duration of the undergraduate program.

- A minimum Cumulative Grade Point Average (CGPA) or Cumulative Performance Index (CPI) of 6.0 on the scale of 0-10 with corresponding proportional requirements when the scales are other than 0-10 (for example, 4.8 on a scale of 0-8).

For SC/ST/PWD category candidates, a relaxation of 5% in the performance at the qualifying degree is applicable.

Merely satisfying the eligibility conditions does not guarantee selection into the program.

K.2. APPLICANTS IN THE FINAL PHASE OF GETTING A QUALIFYING DEGREE.

The students who are in the final phase of receiving above mentioned qualifying degree and are likely to graduate before the commencement of the Autumn 2024-25 semester are also eligible to apply. However, if offered, the admission to those candidates would be provisional. To join the academic program at IIT dhArwAD, such candidates need to furnish necessary documents regarding completion of the degree on the date of joining IIT dhArwAD. The date of joining will be announced later the institute website. The candidate needs to meet the criteria specified in Section K.1 above considering the updated score in the qualifying degree. In the meanwhile, the aggregate academic performance announced by the respective university till the last date for submission (mentioned in section A) should be used to determine eligibility for application, and the same should be reported in the online application.

K.3. SCREENING CRITERIA OF APPLICATIONS

The GATE cut off for applying to the M.Tech. Program are as follows: 350 for General/General (EWS) and for other categories, relaxation is given as per GOI norms.

K.4. FINANCIAL SUPPORT CATEGORY

The Department of Mechanical, Materials, and Aerospace Engineering at IIT dhArwAD invites applications for the M.Tech. in Mechanical Engineering program under the TA category for the Academic Year 2024-25.

K.5. NUMBER OF AVAILABLE SEATS

The total number of seats available in the TA category are $20^* + 2^{**} = 22$.

The 20 seats are distributed as per the seat matrix for different social categories.

*20 seats are to be admitted purely based on the GATE score and as per the criteria specified in Sections K.1 and K.3. A minimum of 60% of total seats will be allocated to the students with GATE paper ME and B.Tech/B.E in Mechanical Engineering. The remaining 40% seats may be filled with candidates having non-ME background.

**2 seats are supernumerary for the candidates who have B.Tech. or equivalent degree from IITs or BS degree from IISc with minimum CPI/CGPA of 8.0 on scale of 0-10.

K.6. DEPARTMENT LEVEL CONTACTS FOR ADMISSION PROCESS ENQUIRIES

For queries related to M.Tech. admissions in MMAE Department, one can write to pgadmissions.me@iitdh.ac.in and cc to pgadmissions@iitdh.ac.in with the subject "Query related to M.Tech. Admissions in MMAE".

L. PROGRAM STRUCTURE (M.Tech. in Mechanical Engineering)

Total credit requirement for the course completion: minimum **125 credits**
IC: Institute core = **67 credits**,
PC: Program core = **23 credits**,
PE: Program Electives = 6 + 5 + 4*6 = **35 credits**
1st semester:
- 3 core-courses (6 credits each) = 18 credits prescribed program core
- Minimum 6 credits from "Engineering and Applied Mathematics" basket
- Minimum 5 credits from "Programming and Scientific Computing" basket
- Research Practicum (3 credits)

2nd semester:
- 4 elective-courses (6 credits each)
- 1 core-lab (5 credits)

3rd semester:
- MTech Technical Project-I (32 credits)

4th semester:
- MTech Technical Project-II (32 credits)

1st Semester: (3 Core courses + 2 Elective courses + Research Practicum): 32 Credits

Course Name	L-T-P-C	Objective of the course	Course Category
Advanced Solid Mechanics OR Advanced Mechanisms and Dynamics of Mechanical Systems	3-0-0-6	To introduce and orient students to the concepts of forces, stresses, deflections in mechanical systems. OR To introduce and orient students to the advanced mechanisms & dynamics	PC
Advanced Fluid Mechanics and Heat Transfer	3-0-0-6	To introduce students to the advanced topics in the fluid thermal	PC
Additive and Forming Manufacturing Processes	3-0-0-6	To introduce mathematical concepts, forming and additive manuf., trends and case studies regarding industry 4.0	PC
A course from "Engineering and Applied Mathematics" basket	min. 6 credits	To make the mathematical foundations	PE
A course from "Programming and Scientific Computing" basket	min. 5 credits	To introduce students programming, analysis tools and software, Operating systems, R and Python programming, etc.	PE
Research Practicum (Seminar)	0-0-3-3	To introduce students to literature review, report preparations and seminar presentation to a large audience as seminar on research topics in Mechanical Engineering	IC

*Allocate research practicum seminar topics: seminar coordination by the Faculty Advisor of the batch at the beginning of 1st semester
*Allocate MTech Technical Project Supervisor at the end of 1st semester

2nd Semester: (1 Core Lab + 4 Elective courses): 29 Credits

Course Name	L-T-P-C	Objective of the course	Course Category
Experimental Theory & Laboratory	1-0-3-5	To introduce students with experimental analysis, data analysis, measurement tools and to introduce basic and advance level experiments in FM, HT, SOM, KDOM, Manufacturing	PC
Elective I	3-0-0-6	To give a choice to the student to choose postgraduate level course	PE
Elective II	3-0-0-6	To give a choice to the student to choose postgraduate level course	PE
Elective III	3-0-0-6	To give a choice to the student to choose postgraduate level course	PE
Elective IV	3-0-0-6	To give a choice to the student to choose postgraduate level course	PE

Semester – III: 32 Credits			Semester – IV: 32 Credits		
Course Name	L-T-P-C	Course Category	Course Name	L-T-P-C	Course Category
M.Tech. Project - I	0-8-16-32	IC	M.Tech. Project - II	0-8-16-32	IC

Engineering and Applied Mathematics Basket of Courses: (minimum 6 credits)

- Engineering Mathematics for Advanced Studies
- Mathematics for Data Science
- Numerical Linear Algebra
- Introduction to Numerical Methods

Programming and Scientific computing Basket of Courses: (minimum 5 credits)

- Introduction to Programming and Modeling Laboratory (5 credits)
- Topics in Data structures and Algorithms (6 credits, course put for approval in MTech DSAI)
- Programming Parallel Machines (6 credits)
- Software Development for Scientific Computing (6 credits)

List of available PG electives

Advanced Finite Element Methods	Fracture Mechanics
Advanced Heat Transfer	Fundamentals of Acoustics
Applied Elasticity	Fundamentals of Tribology
Combustion and Fire Dynamics	Introduction to Turbulence and its Modelling
Convective Heat Transfer	Kinematics, Dynamics, and Control of Mechanical System
Design of Mechatronic Systems	Linear Viscoelasticity
Fatigue and Fracture Mechanics	Mechanical Vibrations
Metal Forming and Plasticity	Mechanics of Composite Materials
Non-linear Solid Mechanics	Fluid Flow and Heat Transfer in Porous Media
Turbomachinery Aerodynamics	Modeling of Metal Plasticity: Discrete & Continuum Approaches
Advanced CAM	Satellite Altitude Dynamics and Control
	Design and Manufacturing of Composite Materials